Space Weather Forecast

Issued on Tuesday, 04 April 2023 at 01:21 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of Minor Geomagnetic Storms Days 1-2. Slight chance of Moderate class flares (R1-R2; Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with a few small Common-class flares observed. There are currently four sunspot regions on the visible disc. Most are small and simple with little magnetic complexity. The most notable sunspot group is in the southern hemisphere, west of the Earth-Sun line. The overall size of the region has gradually increased and there is greater magnetic looping evident in coronagraph imagery. No significant Coronal Mass Ejections (CMEs) are forecast to be Earth-directed.

Solar Wind / Geomagnetic Activity: The solar wind varied between Elevated and Slightly Elevated levels (~480-540km/s) due to the ongoing enhancement of a fast stream from a coronal hole. The important north-south component has been weakly fluctuating. Geomagnetic activity was mainly at Quiet to Unsettled (Kp1-3) levels, but with an Active (Kp4) interval 03/1800-2100 UTC.

Energetic Particles / Solar Radiation: High energy proton enhancement (greater than 10MeV) has been at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to continue at Low levels, with a Slight Chance of becoming Moderate.

Solar Wind / Geomagnetic Activity: Although no Earth-directed CMEs are expected, there is a slight chance of a glancing impact from a CME at Earth later on Day 1 (04 Apr).

Solar winds are likely to remain at predominantly Slightly Elevated to Elevated levels on Day 1, owing to the influence of the fast wind from a coronal hole high-speed stream. On Day 1 or Day 2 (05 Apr) Earth is expected to connect to the HSS from one or more small coronal holes. Solar winds are forecast to return to generally Elevated levels and this will probably continue into Day 3 (06 Apr) before easing on Day 4 (07 Apr) back to Elevated or Slightly Elevated levels.

Generally Quiet to Unsettled geomagnetic activity is expected at first on Day 1, with a chance of Active intervals or perhaps isolated G1/Minor Storm conditions, particularly should any CME effects occur. There is an increasing probability of Active or G1/Minor Storm intervals later in the day, or on Day 2. Activity should generally become Quiet to Unsettled again on Days 3 and 4 with a reducing risk of Active or G1/Minor Storm conditions in the absence of any further CMEs.

Energetic Particles / Solar Radiation: No solar radiation storms are expected through the period.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	30	10	5
Strong	G3	No	5	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	15	15	15
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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